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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

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June 1970

U.S. Training and
Employment Service
Technical Report
S-238R

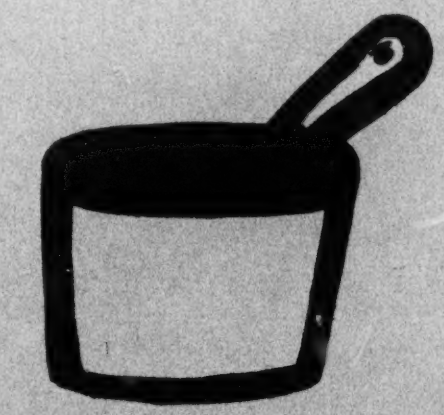
Development of USTES

APTITUDE TEST BATTERY FOR

COOK

(hotel & rest.)
313.381

U.S. DEPARTMENT OF LABOR
Manpower Administration



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Technical Report on Development of USTES Aptitude Test Battery

For . . . .

Cook (hotel & rest.) 313.381

S-238R

(Developed in Cooperation with the Connecticut
and Michigan State Employment Services)

U.S. Department of Labor
Manpower Administration

June 1970

FOREWORD

The United States Training and Employment Service General Aptitude Test Battery (GATB) was first published in 1947. Since that time the GATB has been included in a continuing program of research to validate the tests against success in many different occupations. Because of its extensive research base the GATB has come to be recognized as the best validated multiple aptitude test battery in existence for use in vocational guidance.

The GATB consists of 12 tests which measure 9 aptitudes: General Learning Ability, Verbal Aptitude, Numerical Aptitude, Spatial Aptitude, Form Perception, Clerical Perception, Motor Coordination, Finger Dexterity, and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, with a standard deviation of 20.

Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, in combination predict job performance. For any given occupation, cutting scores are set only for those aptitudes which contribute to the prediction of performance of the job duties of the experimental sample. It is important to recognize that another job might have the same job title but the job content might not be similar. The GATB norms described in this report are appropriate for use only for jobs with content similar to that shown in the job description included in this report.

GATB Study #2396,2086

Development of USTES Aptitude Test Battery

For

Cook (hotel & rest.) 313.381-018

S-238R

This report describes research undertaken for the purpose of developing General Aptitude Test Battery (GATB) norms for the occupation of Cook (hotel & rest.) 313.381-018. The following norms were established:

GATB Aptitudes	Minimum Acceptable GATB Scores
S - Spatial Aptitude	85
P - Form Perception	90
F - Finger Dexterity	70
M - Manual Dexterity	70

Research Summary

Sample:

160 (155 male and 5 female) students enrolled in the Cook curriculum at Chadsey High School, Detroit, Michigan and in the first year (basic) course at the Culinary Institute of America, Inc., New Haven, Connecticut.

This study was conducted prior to the requirement of providing minority group information. Therefore, minority group status is unknown.

Criterion:

Course grades.

Design:

Concurrent (test and criterion data were collected at approximately the same time).

Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, aptitude-criterion correlations and selective efficiencies.

Concurrent Validity:

Phi Coefficient = .24 (P/2 <.005)

Effectiveness of Norms:

Only 75% of the nontest-selected students used for this study were good students; if the students had been test-selected with the above norms, 83% would have been good students. Twenty-five percent of the nontest-selected students used for this study were poor students; if the students had been test-selected with the above norms, only 17% would have been poor students. The effectiveness of the norms is shown graphically in Table 1:

TABLE 1
Effectiveness of Norms

	Without Tests	With Tests
Good Students	75%	83%
Poor Students	25%	17%

SAMPLE DESCRIPTION

Size:

N = 160

Occupational Status:

Students.

School Setting:

Students were enrolled in the Cook curriculum at Chadsey High School, Detroit, Michigan and at the Culinary Institute of America, Inc., New Haven, Connecticut.

School Selection Requirements:

Education : 8th grade required in Detroit; high school graduation required in Connecticut.

Previous Experience: None required.

Tests: None used.

Other: Personal interview and physical examination.

Principal Activities:

The job duties for each worker are comparable to those shown in the job description in the Appendix.

Minimum Instruction:

All students in the Michigan sample had completed 3 courses in Cooking (30 semester hours) and 40 semester hours in the Commercial Foods Curriculum. All students in the Connecticut sample had completed one year of course work.

TABLE 2

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for Age, and Education.

	Mean	SD	Range	r
Age (years)	22.0	4.5	15-38	.21**
Education (years)	11.9	1.2	8-17	.17*

*Significant at the .01 level.
**Significant at the .05 level.

EXPERIMENTAL TEST BATTERY

All 12 tests of the GATB, B-1002A were administered in September, 1954, in New Haven and from June, 1957 to November, 1960 in Detroit.

CRITERION

The criterion for the Michigan sample consisted of Grade-Point Averages for the courses in the Commercial Foods Department. Other course grades were not considered. The distribution of the averages ranged from 16 to 40 with a mean of 27.8 and a standard deviation of 6.

The criterion for the Connecticut sample is based on written examinations designed to test the student's understanding and retention of subjects taught on cooking theory. Four examinations were given - one at the end of each of the four terms. The score on this criterion is the average of the scores made on the four examinations. The distribution of term grade scores ranges from 44 to 92. The mean is 78.6 and the standard deviation is 8.8.

Since both of the samples consisted of students who were being prepared to perform similar job duties, the two samples were combined on the basis of both statistical and qualitative considerations.

Criterion Dichotomy:

The criterion distribution was dichotomized into low and high groups by placing 25% of the sample in the low group to correspond with the percentage of students considered unsatisfactory or marginal. Students in the high criterion group were designated as "good students" and those in the low group as "poor students."

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes were selected for tryout in the norms on the basis of a qualitative analysis of job duties involved and a statistical analysis of test and criterion data. Aptitudes N,F, and M were considered for inclusion in the norms because they have high correlations with the criterion. Aptitudes N and M which do not have high correlations with the criterion, were considered for inclusion in the norms because the qualitative analysis indicated that the aptitudes might be important for the job duties and the sample had a relatively high mean score for Aptitude M and a relatively low standard deviation for Aptitude N. Aptitude F was considered for inclusion in the trial norms since it was considered of critical importance to the performance of job duties. Tables 3,4, and 5 show the results of the qualitative and statistical analyses.

TABLE 3

Qualitative Analysis
(Based on the job analysis, the aptitudes indicated appear to be important to the work performance)

Aptitudes	Rationale
G - General Learning Ability	Required to learn and understand the theory of food preparation.
N - Numerical Aptitude	Required in ordering supplies, figuring quantities and costs, and planning menus.
P - Form Perception	Required to set up food arrangements and displays.
F - Finger Dexterity	Required in handling tools, food and utensils.
M - Manual Dexterity	Required in manipulating tools, appliances and foodstuffs.

On the basis of the job analysis data, Aptitude V - Verbal Aptitude was rated "irrelevant" for successfully performing the duties of this job.

TABLE 4

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N=160

	Mean	SD	Range	r
G - General Learning Ability	101.1	13.2	65-137	.222**
V - Verbal Aptitude	95.5	12.9	68-135	.120
N - Numerical Aptitude	99.4	14.9	49-135	.115
S - Spatial Aptitude	105.8	17.3	58-150	.253**
P - Form Perception	102.0	16.9	43-147	.196*
Q - Clerical Perception	99.0	12.8	72-137	.099
K - Motor Coordination	101.4	17.9	56-150	.123
F - Finger Dexterity	94.9	20.3	35-156	.035
M - Manual Dexterity	105.0	20.[illegible]	29-[illegible]58	.043

*Significant at the .05 level.
**Significant at the .01 level.

TABLE 5
Summary of Qualitative and Quantitative Data
(Michigan)

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important	X		X		X			X*	X
Irrelevant		X							
Relatively High Mean				X	X				X
Relatively Low Standard Dev.	X	X	X			X			
Significant Correlation With Criterion	X			X	X				
Aptitudes to be Considered for Trial Norms	G		N	S	P			F*	M

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the basis of the degree to which trial norms consisting of various combinations of aptitudes G,N,S,P,F and M at trial cutting scores were able to differentiate between the 75% of the sample considered to be good students and the 25% of the sample considered to be poor students. Trial cutting scores at five-point intervals approximately one standard deviation below the mean are tried because this will eliminate about one-third of the sample with three-aptitude norms. For four-aptitude trial norms, cutting scores of slightly less than one standard deviation below the mean will eliminate about one-third of the sample; for two-aptitude trial norms, minimum cutting scores of slightly more than one standard deviation below the mean will eliminate about one-third of the sample. The Phi Coefficient was used as a basis for comparing trial norms. Norms of S-85, P-90, F-70 and M-70 provided optimum differentiation for the occupation of Cook (hotel & rest.) 313.381-018. The validity of these norms is shown in Table 6 and is indicated by a Phi Coefficient of .24 (statistically significant at the .005 level).

TABLE 6

Concurrent Validity of Test Norms
S-85, P-90, F-70 and M-70

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Students	33	87	120
Poor Students	22	18	40
Total	55	105	160

Phi Coefficient = .24 Chi Square (X^2_y) = 8.9

Significance Level = $P/2 < .005$

DETERMINATION OF OCCUPATIONAL APTITUDE PATTERN

The data for this study met the requirements for incorporating the occupation studied into OAP-43 which is shown in the 1970 edition of Section II of the Manual for the General Aptitude Test Battery. A Phi Coefficient of .16 is obtained with the OAP-43 norms of S-85, P-90 and F-85.

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FACT SHEET

Job Title: Cook (hotel & rest.) 313.381-018

Job Summary: Prepares and cooks meats, fish, fowl, soups, vegetables, desserts, and other foods.

Work Performed: Orders food supplies: Determines the kind and quantity of foods to be prepared for the day. Estimates and discusses needs for food-stuffs with manager, and orders supplies from contractors or market.

Prepares foodstuffs for cooking: Prepares food (peels, washes, cuts, bones, trims) according to recipes, mixing ingredients and adding condiments according to formula and instruction.

Cooks food: Bastes, roasts, stews and steam cooks meats, fish and fowl according to recipes. Cooks vetetables, fruits and puddings. Makes dressings, gravies, sauces, and soups. Prepares cold meats, sandwiches, griddle cakes and similar short-order items.

Prepares servings: Carves portions of baked and roasted meats, fish, and fowl for individual servings. Sizes portions in keeping with price of meals.

Performs related tasks such as preparing salads, desserts, pastries, breads and cakes. Prepares salads and appetizers according to recipe.

Course Summary: Cooking Courses: Studies and is instructed in the use, maintenance, and operation of cooking implements and appliances. Is instructed in the terminology and nomenclature used in food service. Is given practice and instruction in basic cake decorating, menu planning, food arrangement and the following work stations:

roast cook station	sauce cook station
fry cook station	cold meat station
vegetable preparation station	meat cutting station
soup station	storeroom

Supplementary Courses: May elect course in pantry, pertaining to the preparation of salads, sandwiches, pastries, special desserts and party fare. May elect baking courses, meat cutting, food theory, food service or culinary arts courses. Under supervision, the student is required to operate the equipment properly, plan and prepare menus, and perform the food service duties covered in any course.

Effectiveness of Norms: Only 75% of the nontest-selected students used for this study were good students; if the students had been test-selected with the S-238R norms, 83% would have been good students. 25% of the nontest-selected students used for this study were poor students; if the students had been test-selected with the S-238R norms, only 17% would have been poor students.

Applicability of S-238R Norms: The aptitude test battery is applicable to jobs which include a majority of the job duties described above.

GPO 898.729

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